Development History

In August 2008, the Jinping Mountain Traffic tunnel built by Yalong River Hydropower Development Co.,Ltd. was completed and opened to traffic, providing key conditions for the construction of the laboratory.

2008

2009

In May 2009, Tsinghua University and Yalong River Hydropower Development Co.,Ltd. signed a strategic cooperation agreement to initiate the construction of China Jinping Underground Laboratory Phase I (CJPL-I).

2010

In December 2010, CJPL-I was officially put into operation. With a total volume of approximately 4,000 m^3, it marked a breakthrough in ending China' s lack of extremely deep underground laboratories.

2014

In August 2014, geotechnical excavation works for China Jinping Underground Laboratory Phase II (CJPL-II) commenced.

2016

In December 2016, the CJPL-II project was included in the 13th Five-Year Plan for State Large Research Infrastructure.

2017

In February 2017, the CJPL-II project was completed and passed acceptance. With a spatial volume of approximately 300,000 m^3, CJPL-II is currently the world' s largest underground laboratory in terms of space and has the deepest rock cover.

2018

In December 2018, the National Development and Reform Commission (NDRC) officially approved the feasibility study report of the "Deep Underground and Ultra-low Radiation Background Facility for Frontier Physics Experiments" (DURF), as a State Large Research Infrastructure.

2019

In July 2019, CJPL officially launched the construction of DURF.

2023

In December 2023, the construction of DURF was substantially completed and moved to the stage of installation and debugging of scientific experiment equipment.

2024

In December 2024, the civil engineering works of DURF were completed, and the infrastructure transitioned to the trial operation phase.

中国锦屏地下实验室
China Jinping Underground Laboratory
CJPL
清华大学・雅砻江流域水电开发有限公司

CHINA JINPING UNDERGROUND LABORATORY (CJPL)

China Jinping Underground Laboratory (CJPL) is an extremely deep underground laboratory that was jointly founded and co-constructed by Tsinghua University and Yalong River Hydropower Development Co.,Ltd. in 2009. It is located at Jinping Hydropower Station in Liangshan Yi Autonomous Prefecture, Sichuan Province. It is built in a deeply buried long tunnel of the Jinping-II Hydropower Station, which runs through Jinping Mountain. It boasts the deepest rock overburden (~ 2400m), the largest available space, and the most favorable experimental conditions in the world. It has the advantages of extremely low cosmic-ray flux, low natural rock radiation background, convenient transportation, and complete supporting facilities. As an important achievement in the construction of international platforms for basic research, it has greatly advanced the development of major basic frontier research topics in particle physics,astrophysics, cosmology, and other related fields, and is of great significance to major international basic and applied scientific research.

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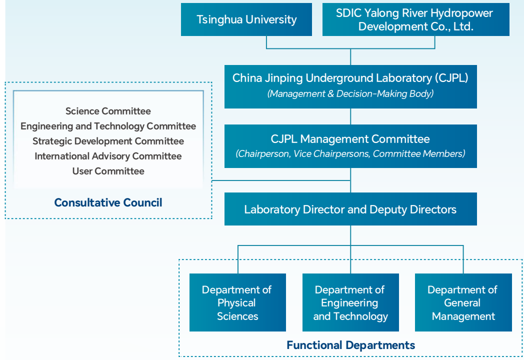
CJPL Organization



Major Achievements

2025.06

On June 25th, 2025, the Tsinghua University team published the measurement of the cosmic-ray muon flux in Astroparticle Physics in China Jinping Underground Laboratory Phase II . The cosmic-ray muon flux is determined to be (3.03 ± 0.24 (stat) ± 0.18 (sys)) × $10^{-10}cm^{-2}s^{-1}$, which is the lowest among underground laboratories worldwide.

2025.03

In March 2025, the PandaX Collaboration, led by Shanghai Jiao Tong University, used the PandaX-4T liquid xenon detector to search for two important new classes of physical particles, axion-like particles and dark photons, and obtained the most sensitive results in the world. The result was published in *Physical Review Letters* (PRL).

2024.11

On November 7th, 2024, the PandaX-4T experiment led by Shanghai Jiao Tong University observed the first signs of coherent scattering of solar boron-8 neutrinos with xenon nuclei. The research results were published in *Physical Review Letters* (PRL) and selected as the "Editor's Choice".

2024.04

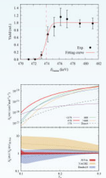
On April 22nd, 2024, the CDEX Collaboration presented a leading result on light dark matter-electron interactions research. This work was published in *Physical Review Letters* titled "A new approach to the analysis of dark matter-electron interactions accelerated by semiconductor detectors gives experimental limits to solar acceleration of dark matter".

2023.06

On June 29th, 2023, the PandaX-4T experiment led by Shanghai Jiao Tong University obtained the world's best result in the search for light dark matter with mass below the proton mass using pure ionization signals. The results were published in *Physical Review Letters* and received the "Editor's Choice".

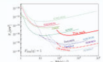
2023.03

In March 2023, the $^{18}O(\alpha, \gamma)^{22}Ne$ reaction was measured at the Jinping Underground Nuclear Astrophysics experimental facility (JUNA) of the CJPL. The key 470 keV resonance energy was measured to be E_α= 474.0±1.1 keV, achieving such high precision for the first time. The spin-parity of this resonance state was determined to be 1−, removing discrepancies in the resonance strengths in earlier studies. The results significantly improve the precision of the $^{18}O(\alpha, \gamma)^{22}Ne$ reaction rates by up to about 10 times compared with the previous data at typical AGB temperatures of 0.1-0.3 GK. We demonstrate that such improvement leads to precise ^{21}Ne abundance predictions, with an impact on probing the origin of meteoritic stardust SiC grains from AGB stars.



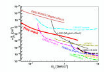
2022.11

In 2022, the CDEX Collaboration published in *Physical Review Letters* (PRL) the strongest solid-state experimental limits on the dark matter-electron scattering cross section above 100 MeV.



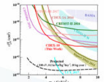
2019.10

In 2019, world-leading dark matter detection sensitivity in the 50-180 MeV mass region was published by the CDEX Collaboration in *Physical Review Letters* (PRL).



2018.06

In 2018, the CDEX Collaboration published a world-leading dark matter detection sensitivity in the 4-5 GeV mass region in *Physical Review Letters* (PRL).



Ultra-low background facility

As the deepest underground laboratory worldwide, CJPL has an ultra-low cosmic-ray flux and is an ideal site for building ultra-low background facilities. The CJPL has built an ultra-low background facility dedicated to material screening for frontier physics experiments such as dark matter direct detection, neutrinoless double beta decay search, and nuclear astrophysics experiments. The facility consists of 19 low background γ spectrometers (GeTHU), an ultra-low background γ spectrometer (ARGUS), and an ultra-low background liquid scintillator spectrometer in the underground space of CJPL. In addition, two ultra-low background α spectrometers and two ICPMS spectrometers have been constructed in the auxiliary laboratory in Xichang city. The above facilities form an above-ground / underground dual-center, multi-technology layout capable of analyzing various types of samples and nuclides with high sensitivity.